

**RECTANGULAR SHAPED GEMSTONE ARRANGEMENT FOR
ATTACHMENT TO A PRONG-TYPE SETTING**

FIELD OF THE INVENTION

The present invention relates to a multi-gemstone arrangement for attachment to a
5 prong-type setting. More particularly, this multi-gemstone arrangement includes four (4)
gemstone sections (each triangular-shaped) for forming a rectangular-shaped gemstone
arrangement. This combined rectangular shape gemstone arrangement gives a larger
appearance than that of a single rectangular gemstone of a similar carat weight.

BACKGROUND OF THE INVENTION

10 Invisible gemstone settings are well known in the art and refer to a setting for
gemstones in which the setting lies beneath the visible surface of the gemstones. Typically,
to invisibly set a large number of gemstones, the approach of the prior art has been to notch
the gemstones and to mount them in a setting having two or more parallel walls, with
metallic projections, for example, prongs or the like, protruding from these walls for
15 engaging the notches. Generally, these walls define channels in which the gemstones are set
abutting one another in accordance with the invisible mounting method.

Invisible gemstone settings for jewelry products suffer from a number of disadvantages. First, casting of jewelry items with a gemstone region including a recess and walls and preparing T-shaped cross bars is relatively difficult and is therefore a costly process. Second, the assembly of the jewelry item requires considerable time of a skilled worker which adds greatly to the overall cost of the jewelry item. And third, the finished jewelry item cannot be readily downsized without disturbing the invisible gemstone setting.

Therefore, there remains a need for a novel invisible and multiple gemstone setting for attachment to rings which overcomes the disadvantages of conventional multi-stone, invisible settings for jewelry items. The multi-stone setting member should include a rectangular-shaped metal setting for holding four triangular-shaped cut gemstones so that the combined gemstone aggregate gives a larger appearance than that of a single gemstone of a similar carat weight. Additionally, the multi-stone setting should give the appearance that the rectangular shaped setting (metal) is essentially invisible to the eye of the wearer.

DESCRIPTION OF THE PRIOR ART

Invisible gemstone settings, multi-gemstone settings, jewelry settings, and multi-gemstone arrangements and the like having various designs, structures, configurations and functions have been disclosed in the prior art. For example, U.S. Patent No. 5,848,539 to
5 OUZOUNIAN discloses an invisible, multiple precious stone setting for mounting two or more rows of rectangular-shaped precious stones. This prior art patent does not disclose the structure and configuration of the multi-gemstone setting of the present invention.

U.S. Patent No. 5,520,017 to VIVAT discloses jewelry items with invisible gemstone settings, wherein the gemstone setting includes at least two walls so as to provide at least one
10 groove. The groove slidably receives one or more rectangular-shaped precious stones therein. This prior art patent does not disclose the structure and configuration of the multi-gemstone setting of the present invention.

U.S. Patent No. 5,123,265 to RAMOT discloses an invisible gemstone setting, wherein the gemstone setting assembly includes one or more gemstones and a setting having
15 a base formed with a plurality of ribs defining one or more sockets of polygonal configuration for receiving the gemstones. This prior art patent does not disclose the structure and configuration of the multi-gemstone setting of the present invention.

U.S. Design Patent No. 334,154 to BENDERLY discloses a round, pie-shaped gemstone arrangement. This pie-shaped/round gemstone arrangement includes six (6) gemstone sections for forming this rounded gemstone. This prior art design patent does not disclose or teach the structure and configuration of the multi-gemstone setting of the present invention.

U.S. Design Patent No. 372,883 to ADLER discloses a round, pie-shaped gemstone arrangement. This pie-shaped/rounded gemstone arrangement includes four (4) gemstone sections for forming this rounded gemstone, but does not use a princess-cut diamond. This prior art design patent does not disclose or teach the structure and configuration of the multi-gemstone setting of the present invention.

None of the aforementioned prior art patents disclose or teach the multi-gemstone setting member of the present invention for receiving therein four triangular-shaped gemstones which combine to give the appearance of a single large rectangular shaped gemstone with the setting having an invisible profile.

Accordingly, it is an object of the present invention to provide a multi-gemstone setting member for holding therein four triangular-shaped gemstones so that the combined aggregate of the four gemstones gives a larger appearance than that of a single rectangular gemstone of a similar carat weight (i.e., a 1.2 carat presentation of the combined four gemstones appears as large as a 2.0 carat rectangular gemstone, as the present invention would have a larger table).

Another object of the present invention is to provide a multi-gemstone setting member having four triangular-gemstones therein that is less expensive than a single rectangular-shaped gemstone of a similar carat weight (i.e., the 1.2 carat presentation of the combined four gemstones is less expensive than an actual 1.2 carat single rectangular gemstone of the same carat weight).

Another object of the present invention is to provide a multi-gemstone setting member having four triangular-shaped gemstones therein which gives the appearance that the setting is substantially invisible at distances greater than 12 inches from the jewelry product.

Another object of the present invention is to provide a multi-gemstone setting member that can be varied in size depending upon the total combined carat weight of the four gemstones within the setting member.

Another object of the present invention is to provide a multi-gemstone setting member that can be made from precious metals such as gold, silver, platinum or palladium for setting precious gemstones including diamonds, rubies, sapphires, emeralds and the like.

Another object of the present invention is to provide a multi-gemstone setting member having four gemstones therein for use in personal adornment in the form of ornamental jewelry such as rings.

Another object of the present invention is to provide a multi-gemstone setting member having four gemstones thereon that can be produced in an economical manner and is readily affordable by the jewelry consumer.

SUMMARY OF THE INVENTION

In accordance with the present invention, there is provided a multi-stone gemstone or diamond arrangement and a prong setting for receiving four substantially triangular-shaped gemstones or diamonds in the setting for forming a substantially rectangular-shaped gemstone or diamond arrangement. The prong setting includes a prong assembly having four prong members. The prong setting also includes an upper rail assembly having four side rail members and four corner rail members; the four corner rail members being attached to the four prong members, respectively. The prong setting further includes an upper frame assembly having first and second crossbar members, the first crossbar member having first outer ends and the second crossbar member having second outer ends. The first and second crossbar members form an X-shaped configuration and each is connected at its respective first and second outer ends thereof to the corner rail members for forming four seating areas. Each of the four seating areas is for receiving therein one of four triangular-shaped gemstones or diamonds within each of the four seating areas. The four triangular-shaped gemstones or diamonds each have three side walls and each have first and second retaining corners and a third apex corner, respectively; each of the first and second retaining corners form a corner retaining angle with at least two of the side walls. Each of the four prong members have a retaining insert slot therein for receiving and engaging at least a portion of the first and second retaining corners of two adjacent gemstones or diamonds to keep the four gemstones or diamonds seated within each of the four seating areas of the prong setting.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects, features, and advantages of the present invention will become apparent upon the consideration of the following detailed description of the presently-preferred embodiment when taken in conjunction with the accompanying drawings; wherein:

5 Figure 1 is a top perspective view of the rectangular shaped gemstone arrangement of the preferred embodiment of the present invention showing four triangular-shaped gemstone sections forming a single rectangular-shaped gemstone arrangement;

 Figure 2 is a bottom perspective view of the rectangular shaped gemstone arrangement of the preferred embodiment of the present invention showing the four triangular-shaped
10 gemstone sections formed in the single rectangular-shaped gemstone arrangement;

 Figure 3 is a top plan view of the rectangular shaped gemstone of the present invention showing the four triangular-shaped gemstone sections formed in the single — rectangular-shaped gemstone arrangement;

 Figure 4 is a bottom plan view of the rectangular shaped gemstone of the present
15 invention showing the four triangular-shaped gemstone sections formed in the single rectangular-shaped gemstone arrangement;

 Figure 5 is a front elevational view of the rectangular shaped gemstone of the present invention showing multiple girdles of the triangular-shaped gemstones in the formed single rectangular-shaped gemstone arrangement;

20 Figure 6 is an end elevational view of the rectangular shaped gemstone of the present invention showing multiple girdles of the triangular-shaped gemstones in the formed single rectangular-shaped gemstone arrangement;

Figure 7 is a top perspective view of the rectangular shaped prong setting of the present invention showing an upper frame assembly, an upper rail assembly, a prong assembly, a lower frame assembly and a seating area assembly for forming the prong setting;

5 Figure 8 is a bottom perspective view of the rectangular shaped prong setting of the present invention showing the major component assemblies of the prong setting;

Figure 9 is a top perspective view of the rectangular shaped gemstone and prong setting of the present invention showing the four triangular-shaped gemstone sections being held within a prong setting in the formed single rectangular-shaped gemstone arrangement;

10 Figure 10 is an exploded perspective view of the rectangular shaped gemstone and prong setting of the present invention showing the four triangular-shaped gemstone sections being placed within the prong setting for forming the single rectangular-shaped gemstone arrangement;

Figure 11 is a top plan view of the front triangular-shaped gemstone section of the present invention showing an apex angle alpha (α) being greater than 90° ;

15 Figure 12 is a bottom plan view of the front triangular-shaped gemstone section of the present invention showing the facet design of the front gemstone section;

Figure 13 is a front elevational view of the front triangular-shaped gemstone section showing the facet design on its pavilion;

20 Figure 14 is a top plan view of the end triangular-shaped gemstone section of the present invention showing an apex angle beta (β) being less than 90° ;

Figure 15 is a bottom plan view of the end triangular-shaped gemstone section of the present invention showing the facet design of the end gemstone section; and

Figure 16 is an end elevational view of the end triangular-shaped gemstone section showing the facet design on its pavilion.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The multi-stone rectangular shaped gemstone and diamond arrangement 10 and prong setting 30 and their component parts of the preferred embodiment of the present invention are represented in detail by Figures 1 through 16 of the patent drawings. The multi-gemstone rectangular shaped setting 30, as shown in Figures 7 through 10, is used for holding in place four (4) triangular-shaped gemstones or diamonds 22, 24, 26 and 28 so as to form the rectangular gemstone arrangement 10.

Each of the triangular-shaped gemstones or diamonds 22, 24, 26 and 28 include three beveled side walls 22a, 22b and 22c; 24a, 24b and 24c; 26a, 26b and 26c; and 28a, 28b and 28c, respectively, as shown in Figures 1, 3 and 8 of the drawings. Further, each of the triangular-shaped gemstones or diamonds 22, 24, 26 and 28 include multi-faceted pavilions 22p, 24p, 26p and 28p, respectively, as shown in Figures 2, 4 through 6 and 11 through 16 of the drawings. Also, each of the gemstones or diamonds 22, 24, 26 and 28 include a first outer retaining corner 22d, 24d, 26d and 28d; a second outer retaining corner 22e, 24e, 26e and 28e; and a third inner corner 22f, 24f, 26f and 28f, respectively, as shown in Figures 1, 3 and 9 of the drawings.

Additionally, each of the triangular-shaped gemstones or diamonds 22, 24, 26 and 28 include an upper beveled facet 22g, 24g, 26g, 28g, a middle beveled facet 22h, 24h, 26h and 28h and a lower girdle facet 22i, 24i, 26i and 28i, as shown in Figures 1, 3 and 8B of the drawings. Further, beveled side walls 22b, 24b, 26b and 28b are defined as the outer/exterior

side wall (a front side wall) of each of the triangular-shaped gemstones or diamonds 22, 24, 26 and 28, respectively.

Gemstone or diamonds 22 and 26 are identically shaped, each having an acute arc angle alpha (α) of less than 90° at the third inner corners 22f and 26f, respectively.

5 Gemstones or diamonds 24 and 28 are identically shaped, each having an obtuse arc angle beta (β) of greater than 90° at the third inner corners 24f and 28f, respectively. Acute arc angle alpha (α) is in the range of 60° to 75° with a preferred acute arc angle alpha (α) of 70° , and obtuse arc angle beta (β) is in the range of 105° to 115° with a preferred obtuse arc angle beta (β) of 110° . Each of the gemstones or diamonds 22, 24, 26 and 28 are made from a
10 rough gemstone or diamond (not shown) having a substantially flat and long shape or having a substantially flat triangular shape. The gemstones or diamonds 22, 24, 26 and 28 are then cut (by laser cutting) to the specified triangular shapes as previously designated, each having the specified acute arc angle alpha (α) for gemstones or diamonds 22 and 26 and having the specified obtuse arc angle beta (β) for gemstones or diamonds 24 and 28, respectively.

15 Each of the outer or exterior front side walls 22b, 24b, 26b and 28b includes a corner retaining angle for the first and second retaining corners 22d, 22e, 24d, 24e, 26d, 26e, 28d and 28e, respectively, such that gemstones or diamonds 22 and 26 include corner retaining angles gamma (γ) relative to the outer front side wall 22b and 26b, respectively, and that gemstones or diamonds 24 and 28 include corner retaining angles delta (δ) relative to the
20 outer front side walls 24b and 28b, respectively, as shown in Figures 11 and 14 of the drawings. Each of the corner retaining angles gamma (γ) is 35° relative to the outer front side walls 22b and 26b of gemstones or diamonds 22 and 26, respectively. Each of the corner retaining angles delta (δ) is 55° relative to the outer front side walls 24b and 28b of

gemstones or diamonds 24 and 28, respectively. Thus, the corner retaining members 28e and 22d, 22e and 24d, 24e and 26d, and 26e and 28d of two adjacent gemstones or diamonds 28 and 22, 22 and 24, 24 and 26, and 26 and 28 have each of the corner retaining angles gamma (γ) and delta (δ) being in alignment with each other to cooperate in forming a straight-edged corner member C_1 , C_2 , C_3 and C_4 of the gemstone or diamond arrangement 10, as shown in Figures 1 and 2 of the drawings. Each of the straight-edged corner members C_1 , C_2 , C_3 and C_4 are received within retaining means of four prong members 62, 64, 66 and 68 of a prong assembly 60. Thus, each of two opposing straight-edged corner members C_1 and C_3 , and C_2 and C_4 of gemstone or diamond arrangement 10 are in a parallel relationship with each other, as shown in Figures 1 through 4 of the drawings.

The rectangular shaped prong setting 30, as shown in Figures 7, 8 and 10, includes an upper frame assembly 40 having first and second crossbar members 42 and 44 attached thereto; an upper rail assembly 50 having first, second, third and fourth upper side rail members 52, 54, 56 and 58 with first, second, third and fourth upper corner rail members 53, 55, 57 and 59, respectively, attached thereto; a prong assembly 60 having four prong members 62, 64, 66 and 68 attached thereto; and a lower frame assembly 80 having first, second, third and fourth lower frame side rail members 82, 84, 86 and 88.

The first crossbar member 42 includes outer ends 42a and 42b, and the second crossbar member 44 includes outer ends 44a and 44b. Each of the first and second crossbar members 42 and 44 at their respective outer ends 42a and 42b, and 44a and 44b are connected to opposing upper corner rail members 53 and 57, and 55 and 59, respectively, as depicted in Figure 7. The crossbar members 42 and 44 form an X configuration 46 within the upper frame assembly 40 and within the upper rail assembly 50 for forming a seating area

assembly 90 therein, as shown in Figures 8 and 9 of the drawings. The seating area assembly 90 includes a first seating area 92, a second seating area 94, a third seating area 96 and a fourth seating area 98. The first, second, third and fourth seating areas 92, 94, 96 and 98 all have triangular-shaped configurations for holding and seating the four (4) triangular-shaped gemstones or diamonds 22, 24, 26 and 28, respectively, therein, as shown in Figures 7 and 10 of the drawings.

Each of the upper side rail members 52, 54, 56 and 58 include outer ends 52a and 52b, 54a and 54b, 56a, and 56b, and 58a and 58b, respectively, as shown in Figure 7 and 10 of the drawings. The outer ends 52a and 52b of upper side rail member 52 are attached to adjacent upper corner side rail members 53 and 59, respectively. The outer ends 54a and 54b of upper side rail member 54 are attached to adjacent upper corner side rail members 53 and 55, respectively. The outer ends 56a and 56b of upper side rail member 56 are attached to adjacent upper corner side rail members 55 and 57, respectively. The outer ends 58a and 58b of upper side rail member 58 are attached to adjacent upper corner side rail members 57 and 59, respectively. The aforementioned attachments of the outer ends of each upper side rail member 52, 54, 56 and 58 to adjacent upper corner side rail members 53 and 59, 53 and 55, 55 and 57, and 57 and 59, respectively, as previously described in the above, forms the substantially rectangular-shaped upper rail assembly 50, as shown in Figure 7, 8 and 10 of the drawings.

Each of the prong members 62, 64, 66 and 68 of prong assembly 60 includes an upper prong end 62a, 64a, 66a and 68a and a lower prong end 62b, 64b, 66b and 68b, respectively. Each of the upper prong ends 62a, 64a, 66a and 68a of prong members 62, 64, 66 and 68 include first, second, third and fourth retaining insert slot members 72, 74, 76 and 78 for

holding portions of the outer corner sections of gemstones or diamonds 22, 24, 26 and 28, respectively, thereon, as depicted in Figures 7 through 11 of the drawings. Each of the lower prong ends 62b, 64b, 66b and 68b are attached to outer ends of the lower side rail members 82, 84, 86 and 88, as depicted in Figures 7 and 8 of the drawings. Further, each of the prong members 62, 64, 66 and 68 includes an exterior wall surface 62c, 64c, 66c and 68c and an interior wall surface 62d, 64d, 66d and 68d having a center section area 62e, 64e, 66e and 68e, respectively. Each of the four corner side rails members 53, 55, 57 and 59 is attached to the interior wall surface 62d, 64d, 66d and 68d at the center section area 62e, 64e, 66e and 68e of each of the four prong members 62, 64, 66 and 68, respectively.

Each of the lower frame side rail members 82, 84, 86 and 88 include outer ends 82a and 82b, 84a and 84b, 86a and 86b, and 88a and 88b, respectively, as shown in Figure 7 and 8 of the drawings. The outer ends 82a and 82b of lower frame side rail member 82 are attached to adjacent lower prong ends 62b and 68b of prong members 62 and 68, respectively. The outer ends 84a and 84b of lower frame side rail member 84 are attached to adjacent lower prong ends 62b and 64b of prong members 62 and 64, respectively. The outer ends 86a and 86b of lower frame side rail member 86 are attached to adjacent lower prong ends 64b and 66b of prong members 64 and 66, respectively. The outer ends 88a and 88b of lower frame side rail member 88 are attached to adjacent lower prong ends 66b and 68b of prong members 66 and 68, respectively. The aforementioned attachments of the outer ends of each lower frame side rail members 82, 84, 86 and 88 to adjacent prong ends of prong members 62, 64, 66 and 68, as previously described above, forms the substantially rectangular-shaped lower frame assembly 80, as shown in Figures 7, 8 and 10 of the drawings. The lower frame side rail members 82, 84, 86 and 88 of the lower frame assembly

80 are attached to the lower prong ends 62b, 64b, 66b and 68b of prong members 62, 64 66 and 68 to provide additional structural strength to the prong setting 30, as shown in Figures 7 and 8 of the drawings.

The seating areas 92, 94, 96 and 98 are used to retain, nest and hold in place
5 gemstones or diamonds 22, 24, 26 and 28, respectively, within the prong setting 30, as shown in Figures 9 and 10 of the drawings. The lower girdle facet 22g of gemstone or diamond 22 engages a portion of crossbar members 44 and 42 at their respective outer ends 44b and 42a. Also, a portion of each of the first and second outer corners 22d and 22e of gemstone or diamond 22 engages a portion of the fourth and first retaining insert slot members 78 and 72
10 of prong members 68 and 62, respectively. The lower girdle facet 24g of gemstone or diamond 24 engages a portion of crossbar members 42 and 44 at their respective outer ends 42a and 44a. Also, a portion of each of the first and second outer corners 24d and 24e of gemstone or diamond 24 engages a portion of the first and second retaining insert slot — members 72 and 74 of prong members 62 and 64, respectively. The lower girdle facet 26g
15 of gemstone or diamond 26 engages a portion of crossbar members 44 and 42 at their respective outer ends 44a and 42b. Also, a portion of each of the first and second outer corners 26d and 26e of gemstone or diamond 26 engages a portion of the second and third retaining insert slot members 74 and 76 of prong members 64 and 66, respectively. The lower girdle facet 28g of gemstone or diamond 28 engages a portion of crossbar members
20 42 and 44 at their respective outer ends 42b and 44b. Also, a portion of each of the first and second outer corners 28d and 28e of gemstone or diamond 28 engages a portion of the third and fourth retaining insert slot members 76 and 78 of prong members 66 and 68, respectively. The aforementioned nesting and holding of the gemstones 22, 24, 26 and 28

within the seating areas 92, 94, 96 and 98, respectively, of the prong setting 30, as described above, forms the rectangular-shaped gemstone arrangement 10, as shown in Figures 1 and 7 of the drawings.

The multi-stone prong setting 30 can be made of gold, silver, platinum, palladium, or other precious metals. The multi-stone prong setting 30 can also be made into different size settings depending upon the size (carat weight) of the triangular-shaped and rectangular-shaped gemstones or diamonds 22 to 28 being mounted therein. The total carat weight for the gemstones or diamonds 22 to 28 typically are in the range of 0.36 carats to 4.0 carats per multi-gemstone prong setting 30. Additionally, other types of gemstones such as rubies, sapphires, emeralds or other precious gems can be used for the multi-stone prong setting 30 of the present invention. Prong setting 30 can be used to form a piece of jewelry in the form of a ring, a pin, a broach, a pendant, a clasp, a necklace, a bracelet, an anklet or earrings.

OPERATION OF THE PRESENT INVENTION

The operation and method for mounting the multi-stone rectangularly shaped gemstone or diamond arrangement 10 within the prong setting 30 of the preferred embodiment of the present invention, as shown in Figures 1, 7 through 10 of the patent drawings, starts with the jeweler mounting one of the upper side rail members 52, 54, 56 or 58 of the upper rail assembly 50 to a jewelry vise (not shown) for the convenient assembly of each of the gemstones or diamonds 22, 24, 26 and 28 within seating areas 92, 94, 96 and 98, respectively, of the multi-gemstone rectangular-shaped prong setting 30 by the jeweler. The jeweler's initial steps are to slidably mount the outer corners 22d and 22e, 24d and 24e, 26d and 26e, and 28d and 28 of gemstones or diamonds 22, 24, 26 and 28 into corresponding retaining insert slot members 78 and 72, 72 and 74, 74 and 76, and 76 and 78 of prong

members 68 and 72, 62 and 64, 64 and 66 and 66 and 68, respectively, such that each gemstone or diamond 22, 24, 26 and 28 is nested within each seating area 92, 94, 96 and 98, respectively, of the prong setting 30, as shown in Figures 7 and 10 of the drawings.

Next, the jeweler slightly bends each of the retaining insert slot members 72, 74, 76 and 78 to frictionally engage the corresponding outer corners, as previously described, of gemstones or diamonds 22, 24, 26 and 28, respectively, as shown in Figures 9 and 10 of the drawings. This above step now sets all of the gemstones or diamonds 22, 24, 26 and 28 within seating areas 92, 94, 96 and 98, respectively, such that the gemstones or diamonds 22, 24, 26 and 28 cannot be removed from the multi-stone prong setting 30, so as to hold the gemstones or diamonds in place and in a secure manner.

A latitude of modification, change, and substitution is intended in the foregoing disclosure, and in some instances, some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.